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as a primitive type, although many botanists will be inclined to consider it as a degenerate rather than as a primitive form.

Of the different types of sporogonium among the Musci the peculiar genus Nanomitrium is interesting as showing very marked similarity in the arrangement of its parts to that of the typical liverworts. In this moss most of the endothecium appears to be composed of sporogenous tissue. Whether this genus, and the similar Archidium, are really primitive types, as Leitget supposed, or are related to the typical Bryineæ, remains to be seen.

The book is fully illustrated and includes many new figures. It is certainly a most important contribution to the literature of the archegoniate plants.

D. H. C.

Aldehyde in Leaves.[1] — The formation of an insoluble "hydrazone" on the addition of metanitrobenzohydrazide to a solution of an aldehyde was taken as a means of the quantitative estimation of the latter substance in green leaves. Previously it has been shown by qualitative tests that a "leaf aldehyde" (Blätteraldehyd) is found in many plants. The quantity present seems to vary within wide limits; the conditions influencing its formation are not understood. From the experiments it appears that leaves kept in continued darkness show a decrease in the amount of aldehyde present, but by no means all of it disappears under such conditions. The bearing of this fact on the suggestions that some form of aldehyde is the first product of photosynthesis are, however, not distinct at present. But while nothing has been shown which proves that such a substance may be the initial carbohydrate formed, it is a matter of interest that the aldehyde can be utilized by the plant as a food substance, and such certainly seems to be the case. It would be of especial value, however, to know something of the relation which exists between the disappearance of starch in the absence of light and the partial use of the aldehyde under similar conditions. One might then be able to conclude whether it is due to the exhaustion of other reserve material that the plant is perforce necessitated to utilize the aldehyde, or whether it exercises any selective power in this regard. The writers do not maintain that the aldehyde is to be regarded as the first assimilation product, — in fact they directly state that it is to be regarded as a by-product; but it is hard to agree with them that had a complete disappearance of this substance been shown by the experiments, conclusive proof would then have been afforded of the primary nature of the aldehyde. H. M. R.

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[1] Reinke, J., and Braunmüller, E. Untersuchungen über den Einfluss des Lichtes auf den Gehalt der grünen Blätter an Aldehyd, *Rev. d. deut. Bot. Gesel.*, Bd. xvii, Heft 1, p. 7.

Light and the Respiration of Fungi.[1] — By a series of carefully arranged experiments, chiefly with *Aspergillus glaucus* and Penicillium, it is shown that the action of light increases (*circa* 10 per cent) the respiration of these fungi, and that this increase is independent of the food supply and of the morphological condition of the culture. As the author says, this increase, though not great, is quite contrary to what our knowledge of these forms would lead us to expect. He refrains from drawing any conclusions from the present data, evidently purposing to pursue the matter further. The results recorded are noteworthy and, if supported by further ones, are of considerable importance. H. M. R.

Spore Development in the Hemiasceæ.[2] — Two forms of this heterogeneous group are considered in detail as to their spore development. These are Ascoidea and Protomyces. In the former it appears that the spores when ripe lie in a mass of protoplasm analogous to the condition generally found among the Ascomycetes, but the multinucleate condition of the ascus and the behavior of these contained nuclei do not seem to correspond to the observations recorded in the late researches on this last-named group. In Protomyces, on the other hand, the spores do not lie imbedded in a mass of unused protoplasm, but are free within the remnant of the protoplasmic sac which still adheres to the wall of the sporangium. This condition the author regards as more nearly akin to that found in the Phycomycetes. The result of the observations seems to show that these two members of the Hemiasci, aside from their radical dissimilarity in other ways, are not closely related in the matter of spore formation. This it will be noticed does not agree with the arrangement of these forms adopted by Brefeld, but to the average observer who has seen Protomyces, points of similarity of that form with the phycomycetous fungi are not surprising. H. M. R.

A New Work on Lichens. — Lieferung 180 of *Die natürlichen Pflanzenfamilien* forms the first portion of Fünfstück's account of the

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[1] Kolbswitz, R. Ueber den Einfluss des Lichtes auf die Athmung der niederen Pilze, *Prings. Jahrb.*, Bd. xxxiii, Heft 1, p. 123, 1898.

[2] Canna, M. L. Popta. Beiträge zur Kenntniss der Hemiasci, *Flora*, Bd. lxxxvi, Heft 1, p. 1, 1899.